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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/890,364	07/30/2001	Paulus Cornelis Duineveld	PHN-17.755	1912

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EXAMINER

LEURIG, SHARLENE L

ART UNIT	PAPER NUMBER
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2879

DATE MAILED: 05/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/890,364

Applicant(s)

DUINEVELD ET AL.

Examiner

Sharlene Leurig

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 18 March 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Response to Amendment*

1. The Amendment filed on March 18, 2003 has been entered and acknowledged by the Examiner.

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-6 and 9-10 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Nagayama et al. (EP 0 732 868 A1) in view of Ilegems et al. (6,208,074). Nagayama discloses an organic electroluminescent device comprising a first electrode (Fig. 3, element 3) and a second electrode (9) with an organic electroluminescent layer (8) provided in accordance with a desired pattern and obtained from a fluid layer in between. The device has a relief pattern (Fig. 8a, element 7) for containing the organic fluid layer (Fig. 8A, element 8R).

Regarding claim 2, Nagayama discloses a device having a relief pattern having a transverse profile with an overhanging section (Fig. 6B, element 71) rendering the relief pattern suitable for patterning the second electrode (Fig. 8D, element 9).

Regarding claim 3, Nagayama discloses a device having a relief pattern that is a composite relief pattern of a first relief pattern (Fig. 6B, element 70) for containing the

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fluid layer (Fig. 8A, element 8R) and a second relief pattern having an overhanging section (Fig. 6B, element 71) rendering the second relief pattern suitable for patterning the second electrode (Fig. 8D, element 9).

Regarding claim 4, Nagayama discloses a device comprising a plurality of independently addressable electroluminescent elements since the adjacent cathodes (Fig. 8D, element 9) are “electrically disconnected to each other,” allowing for separate control of each element (column 11, line 20).

Regarding claim 5, Nagayama discloses a device formed by first providing a first electrode (column 4, line 9), providing a relief pattern for containing a fluid layer from which an organic electroluminescent layer provided in accordance with a desired pattern is obtainable (column 4, lines 12-17), depositing a fluid layer contained by the relief pattern (column 4, lines 18-22 and column 10, lines 17-24), and providing on the organic electroluminescent layer a second electrode (column 4, lines 23-24).

Regarding claim 6, Nagayama discloses a device in which the fluid layer is deposited to a predetermined thickness (column 10, line 15) in the boundaries of a relief pattern but lacks the limitation of a fluid layer gelling when the fluid surface of the fluid layer is approximately level with the top of the relief pattern. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to deposit the fluid layer so that it would gel when the fluid surface of the fluid layer is approximately level with the top of the relief pattern, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claim 10, Nagayama discloses a device having a relief pattern with a height of 3 to 5  $\mu\text{m}$  (column 8, line 32).

While Nagayama discloses an organic electroluminescent device with all the limitations discussed above, he lacks an electroluminescent layer that is substantially uniform in thickness to the extent that the proportion of the organic electroluminescent layer having a thickness within 20% of the minimum thickness of the organic electroluminescent layer or the proportion of the of the organic electroluminescent layer having a thickness within 20% of the maximum thickness of the organic electroluminescent layer, is at least 0.55. However, Nagayama discloses an organic electroluminescent layer of 700 angstroms in thickness.

It is well known in the art that an organic electroluminescent layer with a uniform thickness has more consistent luminescence than one of widely varying thickness. Ilegems teaches the use of spin-coating to provide an organic electroluminescent layer with a "perfectly uniform thickness" (column 4, line 50). Any layer of perfectly uniform thickness inherently fulfills the claimed limitation of a layer where the proportion of the layer having a thickness within 20% of the minimum thickness of the organic electroluminescent layer or the proportion of the of the organic electroluminescent layer having a thickness within 20% of the maximum thickness of the organic electroluminescent layer, is at least 0.55.

Regarding claims 1 and 5, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Nagayama's organic electroluminescent

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device with an organic electroluminescent layer of perfectly uniform thickness formed by spin-coating in order to provide a device with more uniform luminescence.

3. Claim 7 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Nagayama et al. (EP 0 732 868 A1) in view of Ilegems et al. (6,208,074) as applied to claims 1-6 and 9-10 above, and further in view of Kobayashi et al. (6,388,377).

Nagayama discloses an organic electroluminescent device with all the limitations discussed above but lacks a perfectly uniform organic electroluminescent layer as taught by Ilegems. Neither Nagayama nor Ilegems discloses a fluid layer deposited by means of ink-jet printing. However, it is well known in the art to substitute ink-jet printing for any other deposition method in light of its efficiency and accuracy. Kobayashi teaches the use of ink-jet printing to deposit organic electroluminescent material in accordance with a desired pattern on an electrode (column 2, line 53). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Nagayama's organic electroluminescent device with an organic electroluminescent layer of perfectly uniform thickness in order to provide a device with more uniform luminescence and to deposit the fluid layer by means of ink-jet printing in order to improve the efficiency and accuracy of the deposition.

4. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagayama et al. (EP 0 732 868 A1) in view of Ilegems et al. (6,208,074) as applied to claims 1-6 and 9-10 above, further in view of Kobayashi et al. (6,388,377) as applied to claim 7 above, and further in view of Speakman (6,503,831).

Nagayama discloses an organic electroluminescent device with all the limitations discussed above but lacks a perfectly uniform organic electroluminescent layer as taught by Ilegems. Neither Nagayama nor Ilegems discloses a fluid layer deposited by means of ink-jet printing. Kobayashi teaches ink-jet printing as a deposition method but does not disclose a continuous jet of fluid.

Speakman teaches using a continuous ink-jet printing method to deposit fluids (column 10, lines 18-22) on electronic devices such as organic electroluminescent displays. The term "continuous" is interpreted to mean providing a continuous jet of fluid.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the ink-jet printing method of Kobayashi as it is applied to the organic electroluminescent device of Nagayama to dispense fluid continuously, as it is well known in the art to practice continuous ink-jet printing, as taught by Speakman.

### *Response to Arguments*

1. Applicant's arguments filed on March 18, 2003 have been fully considered but they are not persuasive. The applicant has argued that the claimed invention is patentable over the prior art because the applied references neither teach nor suggest the patentable feature of an "electroluminescent layer [that] is substantially uniform in thickness to the extent that the proportion of the organic electroluminescent layer having a thickness within 20% of the minimum thickness of the organic electroluminescent layer or the proportion of the organic electroluminescent layer having a thickness within

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20% of the maximum thickness of the organic electroluminescent layer, is at least 0.55".

The Examiner disagrees.

The applicant has argued the Examiner's assertion that "it is well known in the art that an electroluminescent layer with a uniform thickness has more consistent luminescence than one of widely varying width", arguing that "the correlation between the length and the width of the layer, and the luminescence of the layer is not at issue presently." The applicant's interpretation of the Examiner's argument is contrary to the intention of the Examiner, as the correlation between the thickness of the electroluminescent layer and the constancy of the luminescence of the device is of importance to the motivation of combining the references.

The applicant has argued that Ilegems does not teach the claimed invention because it teaches a perfectly uniform layer. The claim invention does not include the limitation of an electroluminescent layer that must deviate in thickness, but instead claims the acceptable bounds of deviation. The acceptable bounds of deviation include a perfectly uniform layer. Therefore the perfectly uniform layer taught by Ilegems is within the claimed bounds, as at least the entire thickness is within 20% of the maximum or minimum.

With regards to the applicant's arguments concerning disparity in the motivation provided by the Examiner for combining references and the objective of the invention, the motivation for combining references of the prior art does not have to be the same as the objective of the claimed invention. The Examiner has shown proper motivation for



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combining references, i.e., to provide a layer with uniform luminescence, which is sufficient for their combination.

With regards to the Examiner's assertion that ink-jet printing inherently provides a continuous jet of fluid, the rejection of claim 8 is removed in favor of a new rejection that provides art disclosing continuous ink-jet printing.

### *Conclusion*


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sharlene Leurig whose telephone number is (703)305-4745. The examiner can normally be reached on Monday through Friday, 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (703)305-4794. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7382 for regular communications and (703)308-7382 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Sharlene Leurig  
May 6, 2003

SL



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